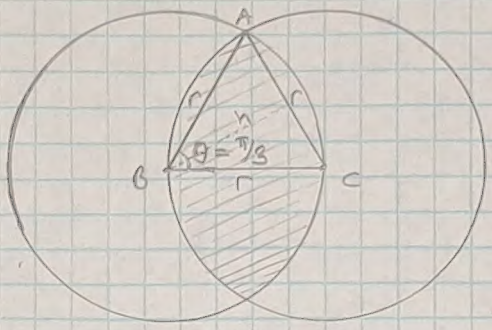


ABC is equilateral triangle

$$\frac{2\pi}{\theta} \quad \frac{360}{60}$$

$$\theta = \frac{\pi}{3}$$

$$A(\hat{ABC}) = \frac{r \cdot \frac{r\sqrt{3}}{2}}{2} = \frac{r^2\sqrt{3}}{4} \qquad r^2 = h^2 + \left(\frac{r}{2}\right)^2 \Rightarrow h = \frac{r\sqrt{3}}{2}$$

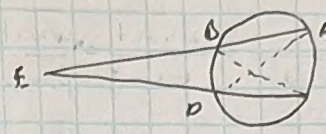
$$A(\hat{ABC}) \Rightarrow \begin{matrix} 2\pi & \pi r^2 \\ \pi/3 & A(\hat{ABC}) \end{matrix} \Rightarrow A(\hat{ABC}) = \frac{\pi r^2}{6}$$

$$A(\hat{AC}) = \frac{\pi r^2}{6} - \frac{r^2\sqrt{3}}{4} = \frac{r^2(2\pi - 3\sqrt{3})}{12}$$

$$A = 2 \cdot \frac{r^2\sqrt{3}}{4} + 4 \cdot \frac{r^2(2\pi - 3\sqrt{3})}{12}$$

$$A = \frac{r^2}{6}(4\pi - 3\sqrt{3})$$

April 1, 2002



$$\frac{EB}{ED} = \frac{EC}{EA}$$

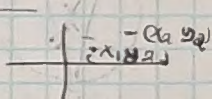
$$V = \frac{1}{3}(\text{Base Area}) \cdot h$$

$$A = \frac{1}{2} p \ell \qquad p : \text{Base perimeter}$$

$$A = \pi r \ell + \pi r^2 \qquad V = \frac{1}{3}\pi r^2 h$$

$$S = 4\pi r^2 \qquad V = \frac{4}{3}\pi r^3$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$\text{slope} = m = \frac{y_2 - y_1}{x_2 - x_1} \qquad x_2 \neq x_1$$

$S_1 \cdot S_2 = -1$ then perpendicular

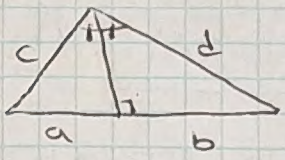
$$Ax + By = C$$

Point slope form $y - y_1 = m(x - x_1)$

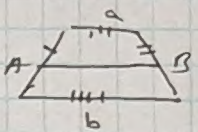
Slope intercept $y = mx + b$

For similar △ $\frac{\text{perimetr 1}}{\text{perimetr 2}} = \frac{\text{basel}}{\text{basel 2}} = \sqrt{\frac{\text{areal}}{\text{areal 2}}}$

$\frac{a}{x} = \frac{x}{b}$ x is geometric mean of a, b



$\frac{a}{c} = \frac{b}{d}$



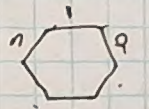
$|AB| = \frac{1}{2}(a+b)$

$\pi = \frac{4}{1} - \frac{4}{3} + \frac{4}{5} - \frac{4}{7} + \frac{4}{9} = \pi$

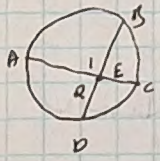
$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!}$

$\hat{B} = \frac{1}{2}\hat{A}$

$A = \frac{1}{2}\text{perimeter} \cdot a$

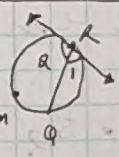


$S^\circ = (n-2)\cdot 180$



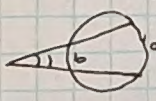
$m\angle 1 = \frac{1}{2}(m\hat{AB} + m\hat{CD})$

$m\angle 2 = \frac{1}{2}(m\hat{AD} + m\hat{BC})$

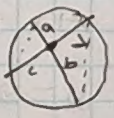


$\hat{1} = \frac{1}{2} m\hat{PK}$

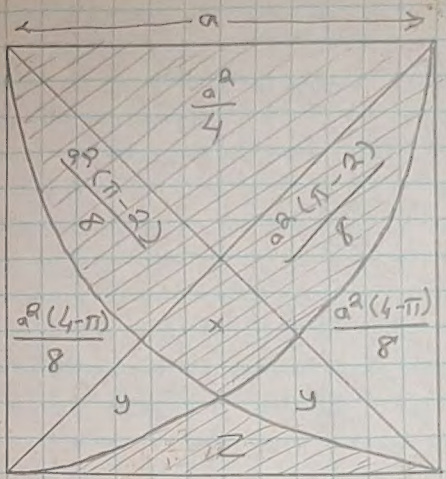
$\hat{2} = \frac{1}{2} m\hat{PMK}$



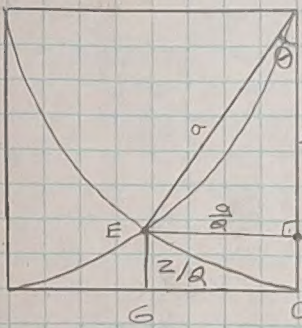
$\hat{1} = \frac{1}{2}(\hat{a} - \hat{b})$



$a \cdot b = c \cdot d$



ABCD is a square.



$\sin\theta = \frac{1}{2} \quad \theta = 30 = \frac{\pi}{6}$

$A(\hat{BEF}) = \frac{a/2\left(\frac{a\sqrt{3}}{2}\right)}{2} = \frac{a^2\sqrt{3}}{8}$

$$\frac{2\pi \quad \pi a^2}{\pi/6 \quad A(\hat{BEC})}$$

$$A(\hat{BEC}) = \frac{\pi a^2 \cdot \frac{\pi}{6}}{2\pi}$$

$$A(\hat{BEC}) = \frac{a^2\pi}{12}$$

$$\frac{z}{2} = \left[\frac{a}{2} \cdot \left[a\left(1-\frac{\sqrt{3}}{2}\right)\right]\right] - \left[\frac{a^2\pi}{12} - \frac{a^2\sqrt{3}}{8}\right]$$

$$z = 2\left[\frac{2a^2 - a^2\sqrt{3}}{4} - \left(\frac{2a^2\pi - 3a^2\sqrt{3}}{24}\right)\right]$$

$$z = \frac{a^2}{12}(12 - 3\sqrt{3} - 2\pi)$$

$$y+z=\frac{a^2}{2}-\frac{\pi a^2}{8}$$

$$y=\frac{a^2}{2}-\frac{\pi a^2}{8}-z=\frac{\pi a^2-12a^2+6a^2\sqrt{3}}{24}$$

$$x+y=\frac{\pi a^2-2a^2}{8}$$

$$x=\frac{\pi a^2-2a^2}{8}-y=\frac{2\pi a^2+6a^2-6a^2\sqrt{3}}{24}$$

&

Area of the cup:

$$x+z+\frac{a^2}{4}+\frac{a^2(\pi-2)}{8}+\frac{a^2(\pi-2)}{8}=A(CUP)$$

$$\boxed{A(CUP)=\frac{a^2}{6}(6-3\sqrt{3}+\pi)}$$

March 31, 2002